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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/623,521

07/22/2003

Shigeo Kofune

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22850

7590

11/29/2004

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

JAGAN, MIRELLYS

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/623,521

Applicant(s)

KOFUNE ET AL.

Examiner

Mirellys Jagan

Art Unit

2859

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) 4, 5 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 6-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/22/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of species 2 in the reply filed on 9/9/04 is acknowledged. The traversal is on the ground(s) that a search for both species is not a burden on the examiner. This is not found persuasive because species 1 requires a different search than species 2, e.g., species 1 requires a search in class 136/228, whereas species 2 does not. Therefore, the requirement is still deemed proper and is therefore made FINAL.

Claim Objections

2. Claims 1-3 and 6-16 are objected to because of the following informalities:

In claim 1, there is lack of antecedent basis in the claim for "the connected portion" in lines 6-7.

Claim 2 states that the members of claim 1 have a rod-like portion. First, it is not clear what is being encompassed by "-like", therefore the use of the term 'rod-like' is objected to. Furthermore, the claim appears to state that the members are attached to (have) a rod 'portion', which is not clear since the members of claim 1 are disclosed to be rods. Second, it is not clear if the connected ends of claim 2 are the same connected ends of claim 1, or if the temperature measuring portion is the same as the temperature measuring portion of claim 1, i.e., claim 2 does not clearly refer back to the limitations of claim 1, and therefore appears to be stating that there is another connecting portion and temperature measuring portion to the ones claimed in claim 1.

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In claim 15, there is lack of antecedent basis in the claim for the metal carbide member having an “outer circumferential portion” and an “end”, as stated in lines 2 and 3, respectively.

Claims 3, 6-14, and 16 are objected to for being dependent on an objected base claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.

Claim 16 claims a method for producing the apparatus of claim 1, but only sets forth steps for producing the high melting point metal carbide member of the apparatus of claim 1. Therefore, claim 16 is incomplete since it fails to claim the steps necessary for producing the apparatus of claim 1.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 1, 6, 8, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 1,823,706 to Staehle.

Staehle discloses a thermocouple comprising:

a first member (1) formed of a high melting point metal carbide (TaC); and

a second member (2) formed of carbon system material (graphite);

wherein the first and second members are connected, and the connected portion (3) serves as a temperature measuring portion (see lines 8-26).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3 and 6-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,092,938 to Kanda et al [hereinafter Kanda] in view of Staehle.

Kanda discloses a thermocouple comprising:

a first rod (2) and a second rod (3),

wherein an end of the rods are connected using a connecting member (4) formed of the material of either the first or second rod to serve as a temperature measuring portion, and are formed with external threading to provide connect with internal threads of the connecting member (see figure 1(a); column 1, lines 13-21; column 2, lines 32-48; column 3, lines 50-59; column 4, lines 47-58; column 6, line 57-column 7, line 15; and column 7, lines 35-45).

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Kanda does not disclose the material of the first rod being a metal carbide of W, Ta, Ti, Hf, Nb, or Zr; and the material of the second rod being graphite.

Staehle discloses a thermocouple comprising a first member (1) and a second member (2) connected to the first member to form a temperature sensing connection (3). The first and second members are made of graphite and a metal carbide (TaC), respectively. Staehle teaches that these materials are useful for making a high-temperature thermocouple since they provide a thermocouple having a longer life and EMF resistance, and allow temperatures in excess of 2000°C to be measured (see lines 8-26).

Referring to claim 1, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermocouple of Kanda by using a metal carbide and graphite as the material for the first and second rods, respectively, since Staehle teaches that these materials are useful for making a thermocouple for measuring high temperatures.

Referring to claims 7 and 9-12, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermocouple of Kanda and Staehle by using WC, TiC, HfC, NbC, or ZrC as the metal carbide since Staehle teaches that a metal carbide is a useful material for measuring high temperatures, and since the elements Ta, W, Ti, Hf, Nb, and Zr are all metallic transition elements belonging to adjacent Groups 4-6 (i.e., Groups 4-6 in the periodic table).

Claims 14 and 15 are “product by process” claims since the claim language is directed to the steps required to form the metal carbide rod. Therefore, these steps have been given no patentable weight since it has been held that: 1) the determinations of patentability in “product by process” claims is based on the product itself, even though such claims are limited and

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defined by the process; and 2) the product in a “product by process” claim is unpatentable if it is the same as, or obvious from, a product of the prior art, even if the prior art product was made by a different process. See *In re Thorpe et al.*, 227 USPQ 964 (Fed. Cir. 1985).

9. Claims 1 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Staehle in view of U.S. Patent 6,458,218 to Savich.

Staehle discloses a thermocouple having all of the limitations of claim 16, as stated above in paragraph 6, but is silent as to how he produces the metal carbide rod member, and therefore does not disclose producing the metal carbide rod by covering a metal rod with carbon powder and compressing them in a high temperature condition to carbonize the rod material to produce the metal carbide member.

Savich discloses a method of producing a metal carbide member. The method comprises covering a metal member with carbon powder and compressing them in a high temperature condition to carbonize the materials to produce the metal carbide member. The method is useful for providing a member made of TaC (see column 5, lines 31-44, and column 7, line 67-column 8, line 18).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the thermometer disclosed by Staehle by forming the metal carbide rod member as taught by Savich since Savich teaches that such a method is useful for providing a member made of TaC.

Conclusion

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10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents disclose a thermocouple:

U.S. Patent 2,712,563 to Faus

U.S. Patent 4,732,620 to Hunold et al

Japanese Patent 58161836 to Yamazaki

Japanese Patent 01233332 to Furuya

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mirellys Jagan whose telephone number is 571-272-2247. The examiner can normally be reached on Monday-Friday from 11AM to 4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez can be reached on 571-272-2245. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MJ

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November 22, 2004

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A handwritten signature in black ink, appearing to read 'Diego Gutierrez', written in a cursive style.

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

CHRISTOPHER W. FULTON
PRIMARY EXAMINER